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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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OFFICE OF THE SECRETARY

In the matter of

Narrowband Data and Paging Services in the
930-31 MHz Band

Request by Mobile Communications Corpora-
tion of America for a Pioneer's Preference
for Verified Information Paging Service

ET Docket No. 92-100

File No. PP-____

To: The Commission

REQUEST FOR PIONEER'S PREFERENCE

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REQUEST FOR PIONEER'S PREFERENCE

Mobile Communications Corporation of America ("MobileComm"), by its attorneys, hereby requests that the Commission award it a pioneer's preference for its proposed Verified Information Paging ("VIP") service, pursuant to 47 C.F.R. § 1.402(a).^{1/} MobileComm is concurrently filing Comments in ET Docket 92-100 supporting the adoption of a flexible regulatory scheme for a multi-provider nationwide messaging service at 930-31 MHz that would allow development of VIP service.^{2/} MobileComm is also filing applications for an experimental authorization that will enable it to provide ongoing information in support of its proposal.

SUMMARY

MobileComm has developed Verified Information Paging, or "VIP," service as an innovative means of bridging the gap between traditional one-way paging service and the various two-way data communications services that have been introduced in recent years. The VIP concept is a significant step forward in increasing the connectivity between wire-based networks and the

^{1/} See *Pioneer's Preference*, 6 FCC Rcd. 3488 (1991) (*Pioneer Preference Order*), modified on recon., 7 FCC Rcd. 1808 (1992) (*Pioneer Preference Reconsideration*), petitions for recon. pending.

^{2/} A copy of the MobileComm Comments is included as Appendix I.

growing community of paging and portable computer users, providing verified transmission of messages, electronic mail, and other data to those users who do not need full two-way wireless transmission capability.

A VIP messaging system will transfer data at a much higher rate than a traditional paging system and the messages transmitted can be much longer, permitting a wider variety of data to be sent. The user's terminal will automatically transmit a verification message upon receipt of a transmission, and the system provides numerous options for more sophisticated user responses as well. VIP will be able to accommodate over 600,000 users cost-effectively, using a single 50 kHz channel, and permits nationwide seamless coverage comparable to cellular telephone service in scope.

MobileComm's VIP service incorporates numerous innovations, including a high-speed simulcast wireless transmission network and an intelligent Dynamic Network Management ("DNM") plan. The VIP system's digital radio network overcomes the limitations of destructive summing of multipath signals principally by use of an innovative enhanced multi-level frequency-shift keyed modulation scheme, making possible bit rates an order of magnitude faster than conventional paging systems. The DNM plan relies on sophisticated scheduling and location techniques, simulcast forward channel transmissions, and substantial reverse channel reuse, all governed by advanced protocols at the network, data link and physical layers, to maximize efficient use of the spectrum. By balancing the range of forward and reverse channel transmissions, MobileComm will render separate receiver sites largely unnecessary. Furthermore, the innovative multi-level frequency-shift-keyed modulation technique MobileComm plans to use in the VIP system will substantially improve the spectral efficiency of a messaging system, while maintaining a high degree of reliability and robustness.

MobileComm's innovations embodied in the VIP system represent a major advance in the state of the art in both simulcasting and in mobile data communications, heralding a new era in

efficient, economical one-way messaging services. The VIP system can be implemented without delay, given access to spectrum. Because of these substantial contributions to the Commission's rulemaking efforts, a pioneer's preference is warranted.

INTRODUCTION

MobileComm has consistently been at the forefront of messaging service development.^{3/} From its early paging days in 1965, MobileComm proceeded to develop paging systems in numerous markets, an effort which culminated in the award to a MobileComm affiliate of one of the three original nationwide paging licenses in the 1980s, and MobileComm remains a leading provider of nationwide paging service today.^{4/} MobileComm has continually introduced new techniques and features to its nationwide paging service to minimize service interruptions while providing an increasingly capable and reliable service. For example, MobileComm will provide nationwide wireless electronic mail ("E-mail") service to the users of palmtop and laptop computers, such as the Hewlett Packard HP-95LX, through the MobileComm nationwide messaging network and the E-mail service of BellSouth Advanced Networks Message Center.

Furthermore, MobileComm and its affiliated companies are deeply involved in delivery of data telecommunications to mobile consumers. As a result of its broad technology base and its involvement with a wide spectrum of services, MobileComm perceives the public's need for radio services from a special perspective that allows it to develop new services designed to meet those needs.

MobileComm has now developed an innovative new service — Verified Information Paging, or "VIP" service. MobileComm's "VIP" service will fill a major gap in the array of currently

^{3/} References to MobileComm in this section include corporate predecessors-in-interest.

^{4/} The nationwide paging system originally established by MobileComm was divested in connection with a corporate reorganization. Subsequently, MobileComm reestablished its presence in the nationwide paging industry through an acquisition and then constructing the nationwide paging network it now operates.

available wireless paging and data services. Specifically, VIP can address the growing connectivity needs of pager and portable computer users. Radio-based local area networks provide excellent connectivity, but only in very localized areas. Existing one-way transmission systems (such as today's paging networks) have ubiquitous coverage and excellent building penetration, but capacity and message length limitations and the lack of any response capability are significant disadvantages for some users. What is lacking is a service that is ubiquitous, simple to use, and highly capable, allowing portable terminal users to receive information with a high degree of reliability.

MobileComm's proposed VIP service addresses these needs. As planned by MobileComm, VIP service will be available throughout metropolitan areas nationwide and will be capable of providing service options ranging from alphanumeric paging service with automatic verification of receipt by the user's terminal, all the way to data transmissions with a variety of user-selectable responses. A VIP subscriber will not have to carry an ordinary pager as well as a VIP-equipped terminal.

DISCUSSION

I. DESCRIPTION OF MOBILECOMM'S PROPOSED VERIFIED INFORMATION PAGING ("VIP") SERVICE

MobileComm's proposed VIP service is designed to meet the needs of a variety of data and paging subscribers. The service delivered to all subscribers will be based on a nationwide array of metropolitan wide-area transmission networks. The VIP concept calls for nationwide, simulcast, high-volume, high-speed one-way data delivery transmissions with a variety of response or acknowledgment options for the subscriber.

A. Service Features

VIP service incorporates numerous features not available in today's messaging or paging systems. Some of the innovative features planned for VIP service, which are described in more detail in MobileComm's Comments filed today (a copy is included as Attachment I) are:

- Autonomous Registration and Automatic Message Routing (the terminal unit registers with the local serving base station without user intervention, permitting the system to route messages to the last known location of the unit);
- Delayed Transmission of Undeliverable Messages (link-level verification of receipt permits the system controller to store and retransmit messages not verified as received);
- Alternative Delivery of Undeliverable Messages (user may specify delivery by voice mail or facsimile of messages not verified as received after specified time period);
- Soft Key Response Option (terminal unit can provide multiple user-customizable responses to messages);
- Received and Read Acknowledgment Option (terminal unit can transmit automatic verification of user's actual retrieval of message, not merely link-level reception);
- Security and efficiency features (encryption and compression); and
- Multimedia message delivery (with suitable terminal equipment and software, graphic images and digitized sound messages can be delivered).^{2/}

B. Subscriber equipment

Many of the features described above would be phased in as subscriber terminal equipment becomes increasingly sophisticated, in response to customer demands and network capabilities. Given the highly responsive nature of the computer and communications equipment

^{2/} Although the issue should not be a concern of the Commission in reviewing MobileComm's request, MobileComm will seek appropriate waivers, if any should be required, of the restrictions contained in the Modification of Final Judgment.

industry, a first-generation terminal unit providing many of these capabilities could be available within a year after a volume order is placed.

MobileComm believes, based on its inquiries in the industry, that a first-generation unit the size of a current alphanumeric pager would sell for a wholesale price of about \$250 and would have a 4-line, 40-character readout and a 128 kilobyte random-access memory, permitting storage of 20 E-mail messages, direct display of short (one-line) messages, scrolling of medium-length messages, and display of longer messages by connection to an external computer or printer. The initial units would incorporate link-level acknowledgment and have some form of user acknowledgment. More sophisticated features, such as multiple soft-keys and graphic display, would likely be introduced quickly as the user base grows and becomes more demanding. Similarly, wireless interfaces allowing palmtop and laptop computers to function as sophisticated VIP terminals with the use of suitable software would likely become available rapidly once the service were authorized by the Commission.

C. VIP Network Design and Management

The networks used to provide VIP service to user terminals will use multiple high-power simulcast transmitters within metropolitan areas; these transmission systems will be linked together with a centralized computer functioning as a network controller by means of an intelligent network infrastructure incorporating a variety of landline and satellite facilities.

The radio transmission system used to provide VIP service will use an open, standard protocol, rather than a proprietary protocol. This would have the advantage that it can be incorporated into the offerings of multiple manufacturers. This will make possible multiple sources of supply, which is essential to the establishment of a competitive equipment market, a prerequisite to the development of a large-scale service. Under the control of a centralized computer, the length of base station and terminal transmission cycles can be varied dynamically

in response to changing load conditions. The computer will also coordinate the base stations' scheduling of transmissions to terminals with known locations; this will permit simultaneous transmissions to different terminals by the base stations in different zones, when the terminals' locations are known.

The base stations will simulcast, permitting superior building penetration and service continuity. Simulcasting the transmissions, instead of utilizing a cellular approach, will allow the network to grow at low cost without adherence to an idealized transmission network design. Of course, simulcasting requires only one channel, and is therefore more conservative of spectrum resources than a cellular approach, which would require multiple channels. Furthermore, MobileComm's VIP system is capable of simultaneously addressing multiple units from discrete base stations, thereby achieving the "frequency reuse" advantage typically associated with a cellular configuration, without a need for multiple channels.

MobileComm plans to utilize enhanced multi-level FSK (frequency-shift keyed) modulation techniques that it has developed in conjunction with a major equipment manufacturer. A new modulation technique is needed to permit the utilization of data rates in excess of 4,800 bps, which has traditionally been viewed as the maximum bit rate that can be utilized with traditional binary FSK modulation in a simulcast environment, due to destructive summing effects.⁹ A much higher bit rate will be needed for the VIP transmission network because of the heavy message and scheduling traffic to be carried on the forward channel of a nationwide messaging system. The enhanced multi-level FSK modulation techniques being developed create multiple deviation

⁹ Indeed, the usable data rate of a binary FSK system has typically been much lower; paging systems have traditionally operated at 512 bps, and 1200 bps systems have represented the state of the art data rate for wide area simulcast paging systems. However, with closer spacing of base stations, less delay spread will permit higher symbol rates. In 1991 MobileComm was one of several companies to successfully conduct trials of 2400 bps data transmissions in a simulcast system.

levels in an FSK signal, permitting a higher bit rate while maintaining a baud rate consistent with the limitations imposed by the multipath environment in a simulcast system.⁷

This advanced approach will allow data transmission rates of up to 15,000 bps in a 50 kHz channel in a simulcast system (based on 8-level FSK modulation).⁸ Base stations would operate at up to 3500 watts effective radiated power, which will facilitate wide-area coverage and building penetration with a minimum number of transmitter sites.⁹

Because the terminal units will not require full two-way data transmission ability, but rather only the ability to transmit brief coded acknowledgment signals, a slower bit rate (1200 bps), a 2-level FSK modulation scheme and a narrower bandwidth (12.5 kHz) can be used on the return path. Under these circumstances, the forward (base station) channel and reverse (terminal unit) channel range can be balanced for equivalent transmission range by use of the design criteria of a two-watt ERP terminal transmitter, 60° high-gain sectorized receive antennas, and highly sensitive base receivers.¹⁰ This balanced system design has the advantages of generally requiring reverse channel receivers only at the base station locations, with no additional receive-only sites needed in most cases. Furthermore, the reverse channel design criteria assures that the signaling will be reliable, minimize the terminal cost and complexity, and permit the terminal to do away with an extendable antenna and use normal pager batteries, for simple, low-cost

⁷ MobileComm plans to experiment with multi-level FSK with various parameters, such as three bits per baud interval at 5000 baud, for an effective data rate of up to 15,000 bps. MobileComm will also experiment with lower baud rates, such as 4000 baud, which will permit a data rate of 12,000 bps in difficult conditions. Because these sophisticated modulation methods have not been employed in practice, MobileComm has been working with a major manufacturer to determine their suitability for a simulcast nationwide messaging system. The manufacturer has operated an experimental 8-level FSK system in a 50 kHz bandwidth using Class C amplifiers.

⁸ See Affidavit of John B. Berry, MobileComm Comments (included as Appendix I hereto) at Appendix A.

⁹ Because of the MobileComm VIP system's more sensitive terminal unit (see previous note) and its higher base station effective radiated power, the maximum transmission range of a single transmitter, taking multipath and building penetration into account, is about 6.0 miles, which requires about 1.1 transmitters per 100 square miles. See Berry Affidavit, MobileComm Comments (Appendix I hereto) at Appendix A.

¹⁰ The user terminals in the VIP system would, under these circumstances, have a range of 5.9 miles, nearly identical to the range of the base stations, with 1.1 receive sites per 100 square miles. See MobileComm Comments (Appendix I) at Appendix A.

operation.^{11/} Terminals will access the VIP network utilizing an access method based on a variation of the slotted ALOHA algorithm for reducing the probability of collision among transmissions from competing terminals.

The VIP system's efficiency in meeting substantial demand within a relatively narrow band of spectrum requires extremely precise synchronization of the modulated radio signals, due to the multipath effects inherent in the simulcast environment, and of the scheduling of forward and reverse channel transmissions. MobileComm plans to achieve precise radio signal synchronization by reference to the Global Positioning Satellite System. Overall network control will be accomplished through the use of centralized computer facilities.

D. Nationwide operation

The high level of coordination that is needed in the VIP system at the data scheduling levels can be efficiently accomplished only if a single computer is in control. Furthermore, a critical feature of VIP is that a terminal whose location is unknown can be immediately located, after a failure to respond at its last known location, by retransmission of the unacknowledged message nationwide. While it would be *possible* for separately licensed systems in different regions to closely coordinate their operations so as to achieve these requirements, the separate operation of regional systems on a single frequency would necessarily introduce considerable inefficiencies and would pose the possibility of significant interference if precise synchronization were not maintained. For technical and economic reasons, VIP service is inherently nationwide in scope.^{12/}

^{11/} See MobileComm Comments (Appendix I) at Appendix A.

^{12/} See MobileComm Comments (Appendix I) at 9-10 for further discussion.

II. MOBILECOMM SHOULD BE AWARDED A PIONEER'S PREFERENCE FOR ITS "VIP" SERVICE PROPOSAL

A. Standards for Pioneer's Preference Eligibility and Award

The FCC established its pioneer's preference policies in its *Pioneer Preference Order*^{13/} and *Pioneer Preference Reconsideration*.^{14/} The initial eligibility criterion is that the applicant must show that it has "developed an innovative proposal that leads to the establishment of a service not currently provided or a substantial enhancement of an existing service."^{15/} One seeking to show that its proposal is "innovative" must show that it has "brought out the capabilities or possibilities of the technology or service" or alternatively "brought them to a more advanced or more effective state."^{16/}

In determining whether an applicant's showing warrants award of a preference, the Commission considers factors such as added functionalities, changes in operating or technical characteristics, increased spectrum efficiency, a new use of spectrum, increased communications speed or quality, and significant reductions in cost to the public.^{17/} The Commission said that types of new and enhanced services that might warrant preferences included —

an added functionality provided to a broader group of customers than was previously available or a new technology that permits (1) increased ability to perform an existing work requirement; (2) increased capacity in an existing service; (3) a substantial cost reduction in an existing service; [or] (4) improved quality of an existing service.^{18/}

^{13/} 6 FCC Rcd. 3488 (1991).

^{14/} 7 FCC Rcd. 1808 (1992).

^{15/} *Pioneer Preference Order*, 6 FCC Rcd. at 3494.

^{16/} *Id.*

^{17/} *See id.*

^{18/} 6 FCC Rcd. at 3494.

In general, one requesting a pioneer's preference must file a petition for rulemaking,^{19/} but when the FCC has already initiated a proceeding or the subject matter has been addressed in other petitions for rulemaking, the rulemaking petition is not required.^{20/} In the instant proceeding, the Commission has announced that those requesting pioneers' preferences need not file petitions for rulemaking.^{21/}

An applicant for a pioneer's preference must also demonstrate that its proposal is technically feasible, through experimentation under an experimental license or otherwise.^{22/}

In the following sections, MobileComm demonstrates that it is eligible for a pioneer's preference and that award of a preference to MobileComm for its VIP proposal is well warranted.

B. MobileComm's "VIP" Proposal Is Innovative

MobileComm's VIP proposal meets both criteria the Commission applies in determining whether a proposal is "innovative": (1) it "br[ings] out the capabilities" of a variety of technologies and makes verified, user-customizable messaging possible; and (2) it brings paging service to a "more advanced [and] more effective state."^{23/}

The VIP system will take advantage of an enhanced multi-level frequency-shift keying modulation technique that will make possible a greatly increased bit rate for simulcast messaging service with a high degree of reliability. It will also utilize network protocols and management techniques that will make possible a new, nationwide one-way digital messaging service with acknowledgment, verification, and user-customizable response capabilities.

^{19/} 7 FCC Rcd. at 1810-11.

^{20/} 7 FCC Rcd. at 1811.

^{21/} Public Notice, *Deadline to File Pioneer's Preference Requests*, ET Docket 92-100, mimeo 22922 (April 30, 1992).

^{22/} 6 FCC Rcd. at 3493; 7 FCC Rcd. at 1809.

^{23/} 6 FCC Rcd. at 3494.

While VIP is a new service, it is also a more advanced and more effective version of existing paging services, from the paging user's perspective. The VIP system can provide a paging user with the same functions as a conventional paging service but is more technically advanced and effective in how it implements those functions: The increased bit rate resulting from the modulation technique used in VIP will make basic paging service far more spectrally efficient, and the autonomous registration of the user terminal permits different pages to be sent at the same time from the base stations in a simulcast system, further increasing spectral efficiency.

MobileComm's proposed VIP service, accordingly, satisfies the criteria for innovation that have been set by the Commission.

C. MobileComm's Proposed "VIP" Service Is Not Currently Provided, and Is a Substantial Enhancement of Existing Paging Service

MobileComm's proposed VIP service will be both a service not currently available and a substantial improvement over existing paging services. This is because VIP not only permits the transmission of conventional paging messages in a highly efficient manner but also adds significant capabilities not present in existing paging services that meet a need that traditional paging systems cannot begin to address. While some of these needs could be met by existing and proposed two-way data services, the two-way services are not designed for efficiently meeting the need for verified transmission of one-way messages.²⁴ Because VIP service uniquely "fills the gap" between pure two-way and one-way services, VIP is truly a new alternative.

²⁴ For example, a system designed for two-way data transmission would be capable of providing verified paging service, but the system designer may have chosen not to utilize autonomous registration in order to reduce the burden on the reverse channels from registration traffic. This would be a reasonable approach for a two-way data network, given that the reverse channel would be expected to carry significant user-originated traffic. However, the decision to forego autonomous registration could result in a need for a higher ratio of repeated transmissions, including nationwide transmissions, because of a terminal's unknown location.

MobileComm's VIP proposal warrants award of a pioneer's preference based on the ways that it improves and builds upon existing paging service offerings, consistent with the criteria established by the Commission:^{25/}

1. VIP will offer the user *new functionalities* not available in existing paging services — link-level verification, received-and-read verification, customizable "soft key" responses, extended message length, customized handling of undeliverable messages, automatic message routing based on autonomous registration, encrypted message transmission, and eventually graphic and digitized sound transmissions.
2. VIP represents a substantial *change in the operating and technical approach* to message transmission from that utilized in traditional paging systems. VIP's use of a modified slotted ALOHA access method for portable terminal response, together with the autonomous registration system and the multi-level FSK modulation technique makes the VIP system's architecture entirely different from that of a traditional paging system.
3. VIP will *increase spectrum efficiency*, both through its use of an advanced modulation technique for increasing data rate and through its ability to address different terminal units from simulcasting base stations due to the system's ability to identify terminals with specific serving base stations through autonomous registration.
4. VIP is a *new use of spectrum* that has specifically been reserved for advanced messaging services.
5. VIP will produce *greater speed and quality* of one-way communications, because its data transmission rate is significantly faster than traditional paging systems, all transmissions include check bytes and error correction data for improved reliability, and the system is designed to provide instant link-level verification of message receipt.
6. VIP will make possible verified one-way messaging at a *substantially lower cost* to the public than would be the case if the customer had no alternative but to use a two-way mobile data network for this function. The system design for a predominantly one-way service is inherently lower-cost than for a fully two-way messaging service, which will likely result in a lower cost of service. Furthermore, the terminal unit will be much less complex and have a lower duty cycle for transmission in the case of a verified one-way service than would be true of a terminal unit designed with full two-way messaging capabilities. The initial wholesale price for such a terminal is likely to be in the \$250 range, based on MobileComm's preliminary inquiries.

^{25/}

6 FCC Red. at 3494.

D. MobileComm's "VIP" Proposal Is Technically Feasible

There are relatively few significant technical obstacles to the establishment of VIP system as proposed by MobileComm. As discussed above, MobileComm will use a standard, open protocol for the coordinated transmission of data within the VIP network. MobileComm has identified a number of protocols that appear to be suitable, although some adaptation may be necessary.

MobileComm has also worked with a major equipment manufacturer to evaluate the suitability of a number of advanced modulation techniques for high-speed data transmission in a simulcast messaging environment. Preliminary test results indicate that 8-level FSK modulation can be utilized with Class C amplification, which is important to a large-scale, high-power simulcast system. Furthermore, a prominent expert consulted by MobileComm has advised that 8-level FSK modulation is likely to be a reliable technique for high-speed data transmission in a simulcast system.

MobileComm has also studied a variety of methods for minimizing collisions in the process of terminal unit access to the VIP network. Based on this evaluation, MobileComm has determined that a modified slotted ALOHA access method is an appropriate technique for access with a minimum of collisions.

MobileComm is filing, contemporaneously herewith, applications for experimental licenses under Part 5 of the Commission's rules, to test and validate a number of coding and modulation schemes in a variety of locations and conditions. The results of this experimentation will be useful determining appropriate techniques to use in urban, suburban, and rural environments.

E. MobileComm Should Be Granted a Nationwide Pioneer's Preference

As MobileComm demonstrates in its Comments,^{26/} the VIP service is inherently nationwide in scope. While the Commission generally disfavors nationwide pioneer's preferences, it has acknowledged that a nationwide preference may be appropriate when the service is "inherently nationwide."^{27/} There would be major economic and technical disadvantages attendant to the operation of a VIP system on less than a nationwide scale.^{28/} Furthermore, if the FCC were to adopt a flexible approach to nationwide messaging systems and licensed systems regionally, there is no certainty that the licensee in an adjacent region would utilize a technically compatible approach. If, for example, a neighboring licensee were to operate out of synchronization with the VIP system, high-powered transmissions from the adjacent system's base stations during the VIP system's reverse channel cycle would saturate the sensitive equipment used to receive transmissions from the terminal units for many miles. Award of a pioneer's preference for only a limited region would thus jeopardize the ability of the VIP network to operate effectively over a large geographic area.

^{26/} MobileComm Comments (App. I) at 9-10.

^{27/} *Pioneer Preference Order*, 6 FCC Rcd. at 3495.

^{28/} See MobileComm Comments (Appendix I) at 9-10.


CONCLUSION

For the foregoing reasons, MobileComm submits that a grant of its request for a nationwide pioneer's preference for its Verified Information Paging system would serve the public interest.

Respectfully submitted,


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Appendix I

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Petition for Rulemaking filed by Mobile)	File No. RM-7978
Telecommunication Technologies Corp.)	

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COMMENTS

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COMMENTS

Mobile Communications Corporation of America ("MobileComm"), by its attorneys, hereby submits its comments on the Petition for Rulemaking filed by Mobile Telecommunication Technologies Corp. ("Mtel"), including a description of a new messaging service that MobileComm calls "Verified Information Paging" ("VIP") service. MobileComm is separately filing on this date its request for a pioneer's preference concerning VIP.

SUMMARY

MobileComm does not oppose the new "Nationwide Wireless Network (NWN) Service" proposed in Mtel's petition, but MobileComm herein demonstrates that Mtel's model NWN service is not the only form of national messaging service that the Commission should consider. Mtel's rulemaking proposal contemplates three national licensees for advanced messaging services, each of which would have access to a 50 kHz channel. Mtel has described its own model of such a service but would not limit the nationwide licensees to the form of service it describes, and instead has proposed the adoption of a regulatory scheme flexible enough to permit the licensees to follow different approaches. MobileComm supports this flexible proposal.

Mtel's model of a nationwide messaging network service is a fully two-way mobile data service that would apparently be very similar, from the user's perspective, to the various mobile

data services already in existence and under development that use existing common carrier or private spectrum allocations.

There is a messaging service that is not available today, however — one that can most effectively be provided only in spectrum set aside for a new service. Specifically, there is not at this time any reasonably feasible means for providing a one-way transmission service with the capability of verifying receipt of the transmission at both the link and user level. MobileComm calls this Verified Information Paging, or "VIP", service — a spectrum-efficient and cost-effective way to bridge the gap between traditional one-way paging service and the two-way mobile data communications services. The VIP concept is a significant step forward in increasing the connectivity between wire-based networks and the growing community of paging and portable computer users, providing verified transmission of messages, electronic mail, and other data to those users who do not need full two-way wireless transmission capability.

A VIP messaging system will transfer data at a much higher rate than a traditional paging system and the messages transmitted can be much longer, permitting a wider variety of data to be sent. The user's terminal will automatically transmit a verification message upon receipt of a transmission, and the system provides numerous options for more sophisticated user responses as well. VIP will be able to accommodate over 600,000 users cost-effectively, using a single 50 kHz channel, and permits nationwide seamless coverage comparable to cellular telephone service in scope.

MobileComm's proposed VIP service incorporates a high-speed simulcast wireless transmission network and an intelligent Dynamic Network Management ("DNM") plan. The VIP system's digital radio network overcomes the limitations of destructive summing of multipath signals principally by use of an enhanced multi-level frequency-shift keyed modulation scheme, making possible bit rates an order of magnitude faster than conventional paging systems. The network management plan relies on adaptive zoning, substantial forward and reverse channel

reuse, and comprehensive scheduling, governed by advanced protocols at the data link and physical layers, to maximize efficient use of the spectrum.

While Mtel's NWN and MobileComm's VIP messaging proposals differ in many respects, they are both attempts to provide a broader range of services to an increasingly mobile, information-dependent society. MobileComm and Mtel are both experienced operators of nationwide paging networks that recognize the limitations of today's paging service. The two companies have developed services that will meet the needs of two different sets of customers — those with two-way messaging needs and those needing a more flexible and comprehensive one-way messaging system. The establishment of rules that will allow both leading nationwide paging service vendors to offer their proposed new services will serve the public interest by encouraging service differentiation and facilities-based competition, giving the customer a more varied palette of service options.

The FCC need not favor one approach over the other in adopting rules. Each company requires a single nationwide 50 kHz channel to effectuate its proposal. The allocation of three nationwide channels for such advanced messaging services, with rules that permit either approach to be employed, will foster the implementation of differing approaches that will satisfy the needs of differing customer groups and at the same time avoid tilting the playing field in favor of one of the major nationwide messaging providers.

INTEREST OF MOBILECOMM

MobileComm has consistently been at the forefront of messaging service development.^{1/} From its early paging days in 1965, MobileComm proceeded to develop paging systems in numerous markets, an effort which culminated in the award to a MobileComm affiliate of one of the three original nationwide paging licenses in the 1980s, and MobileComm remains a leading

^{1/} References to MobileComm in this section include corporate predecessors-in-interest.

provider of nationwide paging service today.^{2/} MobileComm has continually introduced new techniques and features to its nationwide paging service to minimize service interruptions while providing an increasingly capable and reliable service. For example, MobileComm will provide nationwide wireless electronic mail ("E-mail") service to the users of laptop and palmtop computers, such as the Hewlett-Packard HP-95LX, through the MobileComm nationwide messaging network and the E-mail service of BellSouth Advanced Networks Message Center.

Furthermore, MobileComm and its affiliated companies are deeply involved in delivery of data telecommunications to mobile consumers. As a result of its broad technology base and its involvement with a wide spectrum of services, MobileComm perceives the public's need for radio services from a special perspective that allows it to develop new services designed to meet those needs.

DISCUSSION

I. VERIFIED INFORMATION PAGING SERVICE

MobileComm's "VIP" proposal was designed to fill a major gap in the array of currently available wireless paging and data services. Specifically, VIP can address the growing connectivity needs of pager and portable computer users. Radio-based local area networks provide excellent connectivity, but only in very localized areas. Existing one-way transmission systems (such as today's paging networks) have ubiquitous coverage and excellent building penetration, but capacity and message length limitations and the lack of any response capability are significant disadvantages for some users. What is lacking is a service that is ubiquitous, simple to use, and highly capable, allowing portable terminal users to receive information with a high degree of reliability.

^{2/} The nationwide paging system originally established by MobileComm was divested in connection with a corporate reorganization. Subsequently, MobileComm reestablished its presence in the nationwide paging industry through an acquisition and then constructing the nationwide paging network it now operates.